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**Bibliography**

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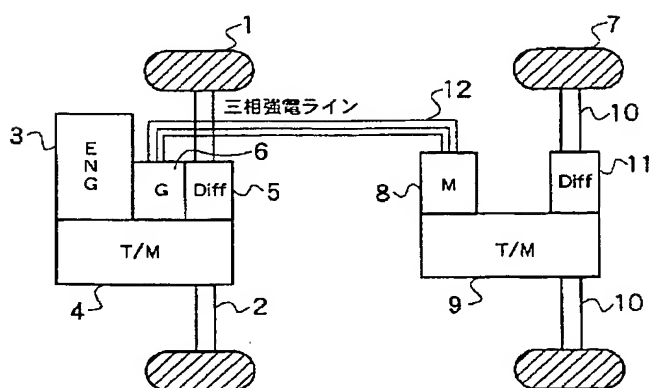
Epitome

(57) [Abstract]

[Technical problem] With a very simple configuration, the compound electric vehicle which can realize part time 4WD is offered.

[Means for Solution] He equips the drive of a rear wheel 7 with an induction motor 8, and is trying to drive by alternating current generated output of the generator 6 in which this induction motor is formed at a front-wheel 1 side. An induction motor 8 does not generate running torque, without a rear wheel's 7 also carrying out follower rotation with the same rotational speed as a front wheel 1, and an induction motor being resisting with the property, by run state currently rotated without the front wheel 1 of an automobile causing a slip, since torque is generated and the rotation drive of the rotator is carried out, when rotating magnetic field which a stator generates, and rotational speed of a rotator shift. However, if a front wheel 1 slips, a gap arises between rotating magnetic field generated in a stator of an induction motor 8 with alternating current power which a generator 6 generates, and rotational speed of a rotator, driving torque over a rear wheel 7 occurs, and it will be in 4WD condition.

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CLAIMS

[Claim(s)]

[Claim 1] Four-wheel-drive equipment characterized by providing the following The 1st wheel driving shaft and the 2nd wheel driving shaft A prime mover A generator which generates alternating current power with rotation driving force of said prime mover The 2nd gear which transmits rotation driving force of said prime mover to said 1st wheel driving shaft, transmits rotation driving force of the 1st gear which carries out a rotation drive, an induction motor by which receives alternating current power of said generator and a rotation drive is carried out, and said induction motor to said 2nd wheel driving shaft, and carries out a rotation drive

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the four-wheel-drive equipment of an electric vehicle.

[0002]

[Description of the Prior Art] Either of the conventional, for example, order, rings (in the following explanation) In the compound electric vehicle which carries out a rotation drive by the prime mover a front wheel -- carrying out -- When it constitutes four-wheel-drive equipment, while carrying out the rotation drive of the front wheel shaft by the prime mover, the rotation drive of the generator is carried out. It is the configuration which AC-DC conversion of the alternating current generated

output of that generator is carried out, and stores electricity a capacitor or a battery, carries out DC-AC conversion of that accumulation-of-electricity force at reverse, supplies the AC motor for rear drives and carries out the rotation drive of the rear wheel shaft with this AC motor.

[0003]

[Problem(s) to be Solved by the Invention] However, since it is necessary to perform appropriately torque allocation with the driving torque of a front wheel by the prime mover, and the driving torque of the rear wheel by the AC motor according to an operation condition in the case of such four-wheel-drive equipment of the conventional compound electric vehicle The converter which performs AC-DC conversion, and the inverter which performs DC-AC conversion, And the controller which performs operation control complicated for suitable control of a converter and an inverter indispensable [ the capacitor or battery for storing electricity ] was needed, and while circuitry became complicated, there was a trouble which becomes expensive in cost.

[0004] This invention was made in view of such a conventional trouble, is an easy configuration, and can be constituted in cost and cheaply, and, moreover, it aims at offering the four-wheel-drive equipment which can perform a four-wheel drive certainly in the transit condition which needs a four-wheel drive.

[0005]

[Means for Solving the Problem] Four-wheel-drive equipment of invention of claim 1 The 1st wheel driving shaft and the 2nd wheel driving shaft, A prime mover and a generator which generates alternating current power with rotation driving force of said prime mover, The 1st gear which transmits rotation driving force of said prime mover to said 1st wheel driving shaft, and carries out a rotation drive, It has an induction motor by which receives alternating current power of said generator and a rotation drive is carried out, and the 2nd gear which transmits rotation driving force of said induction motor to said 2nd wheel driving shaft, and carries out a rotation drive.

[0006] A motor formed in the drive of the 2nd axis arm with four-wheel-drive equipment of invention of claim 1 is an induction motor. This induction motor with that property Since torque is generated and the rotation drive of the rotator is carried out when rotating magnetic field which a stator generates, and rotational speed of a rotator shift In a run state currently rotated without causing a slip, a wheel of the 1st wheel driving shaft of an automobile It runs in the state of a two-flower drive, without [ without a wheel of the 2nd wheel driving shaft also carries out follower rotation with the same rotational speed as a wheel of the 1st wheel driving shaft and an induction motor is resisting, and / therefore ] generating running torque.

[0007] However, if a wheel of the 1st wheel driving shaft causes a slip like [ when a wheel at a case where it is running a transit condition, for example slipping and a cone road surface, that an original four-wheel drive is needed, or the time of the 1st wheel drive carries out a stack ], rotational speed will become larger than rotational speed of a wheel of the 2nd wheel driving shaft, and speed difference will generate a wheel of this 1st wheel driving shaft. Consequently, rotating magnetic field of a stator of an induction motor become quicker than rotational speed of a rotator, slipping occurs, and running torque occurs in an induction motor, and by this, rotation driving force is given to the 2nd wheel driving shaft, the rotation drive of that wheel is carried out, and it changes into a four-wheel-drive condition.

[0008] Consequently, stable transit of an automobile in a skid or a cone road surface is enabled according to grip force of a wheel of the 2nd wheel driving shaft which has not slipped, and escape from a stack is enabled.

[0009]

[Effect of the Invention] According to invention of claim 1, complicated circuitry like before is lost and there is nothing to need expensive passive circuit elements, and it is easy, therefore it can be made in cost and cheap and the PERT/TIME four-wheel-drive equipment which can shift to a four-wheel drive automatically certainly can consist of transit conditions which originally need a four-wheel drive.

[0010]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained in full detail based on drawing. Drawing 1 shows the gestalt of one operation of the four-wheel-drive equipment in a compound electric vehicle. Hereafter, in order to give explanation brief, a front-wheel driving shaft and the 2nd wheel driving shaft are explained for the 1st wheel driving shaft as a rear-drive shaft. However, it does not become a problem that order interchanges practical.

[0011] this -- a four-wheel drive -- equipment -- \*\*\*\* -- a front wheel -- one -- a driving shaft -- two -- rotation -- a drive -- \*\*\*\*\* -- a prime mover (ENG) -- three -- this -- a prime mover -- three -- rotation -- driving force -- transmitting -- a sake -- transmission (T/M) -- four -- this -- transmission -- four -- rotation -- an output -- right and left -- a front wheel -- one -- transmitting -- a sake -- a differential gear (Diff) -- five -- and -- a prime mover -- three -- rotation -- driving force -- direct Here, a generator 6 may be made the connection in which a rotation drive is carried out by the rotation output of transmission 4 by which a rotation drive is carried out by the prime mover 3.

[0012] This four-wheel-drive equipment is equipped with the differential gear (Diff) 11 for transmitting to a rear wheel 7 as a rotation drive of a rear wheel 7 again through the transmission (T/M) 9 for transmitting an induction motor (M) 8 and the rotation driving force of this induction motor 8, and the rear-drive shaft 10 of right and left of the rotation output of this transmission 9.

[0013] Between the generator 6 by the side of before, and the induction motor 8 on the backside, three phase strong \*\* Rhine 12 connects. And fundamentally, a generator 6 and an induction motor 8 are made into the same specification, and are using a generator and another side for one side as induction motors. Therefore, the mechanical size of a rotator and a stator and an electric property are the same. And he is trying to supply the three-phase-alternating-current generation-of-electrical-energy force of a generator 6 to the stator of an induction motor 8 through three phase strong \*\* Rhine 12.

[0014] Next, actuation of the four-wheel-drive equipment of the above-mentioned configuration is explained.

[0015] The usual transit in the condition that the slip is not generated in a <usual transit> forward rear wheel is as follows. \*\* which the rotation driving force which a prime mover 3 generates is transmitted [ \*\* ] to the front-wheel driving shaft 2 through transmission 4 and a differential gear 5, carries out the rotation drive of the front wheel 1, and makes it run an automobile.

[0016] In this run state, since the slip is not generated for the front wheel 1 used as a driving wheel, the order rings 1 and 7 are rotating at uniform velocity. Therefore, the rotator of an induction motor 8 is also rotating the rotator of a generator 6 at uniform velocity. In this uniform rotation, a generator 6 supplies the generated output of B curve in drawing 2 (a) to the stator of an induction motor 8 through three phase strong \*\* Rhine 12. However, the rotator of an induction motor 8 is the rotating magnetic field and uniform velocity which are generated with the alternating current power supplied to this stator, and as rotation driving force is not received from rotating magnetic field, therefore it is shown at the B point of drawing 2 (b), the traction of a rear wheel 7 is zero mostly.

[0017] That is, by the run state without the speed difference, it will run a front wheel 1 by the two-flower drive method used as a driving wheel between the order ring 1 and 7. And since driving torque occurs only in the driving shaft by the side of a generator 6 (here front-wheel driving shaft 2), the wheel (rear wheel 7) by the side of the driving shaft by the side of an induction motor 8 (here rear-drive shaft 10) does not cause a slip.

[0018] When running the case where sudden start <when a slip is generated for a front wheel> is carried out, slipping, and a cone road surface, and when a front wheel 1 carries out a stack, a slip is generated for a front wheel 1, rotational speed rises suddenly and a rotational-speed difference occurs between rear wheels 7.

[0019] If such speed difference occurs, the front-wheel driving shaft 2 will rotate with the rotation

driving force by the prime mover 3 at high speed, and the rotational speed of the rotator of a generator 6 will rise. Consequently, the generation-of-electrical-energy output of a generator 6 is made into the three-phase alternating current of high frequency, and is supplied to the stator of the induction motor 8 by the side of a rear wheel through three phase strong \*\* Rhine 12.

[0020] On the other hand, in an induction motor 8, since the rotational speed of a rear wheel 7 is lower than the rotational speed of a front wheel 1, it will become low [the ratio more nearly same than the rotational speed of the rotator of the generator 6 by the side of a front wheel as the rotational speed of the rotator]. Consequently, delay arises in the rotational speed of a rotator to the rotating magnetic field which the stator of an induction motor 8 generates, a rotator receives driving torque as shown by the C curve in drawing 2 (b), and that driving torque comes to carry out the rotation drive of the rear-drive shaft 10 and rear wheel 7 which are combined with this.

[0021] That is, when a slip is generated for a front wheel 1 and a rotational-speed difference arises between rear wheels 7, an induction motor 8 generates the driving torque according to the speed difference, a rotation drive is carried out by it and a rear wheel 7 will be in the condition of a four-wheel drive in emergency as a result by it. The start acceleration which the transit of which could slip out of the stack by this when the stack had occurred for the front wheel 1, and was stabilized by slipping and the cone road surface with the four-wheel drive was attained, and conformed to treading in of an accelerator also at the time of sudden start will be obtained.

[0022] Drawing 2 (a) shows the range of the generated output of the generator 6 to the output-shaft rotational frequency of the transmission 4 by the side of a front wheel 1, Curve A shows the generated output of the generator 6 after adjustment was added by the regulator by the case where the slip with a big front wheel 1 is caused, and Curve B shows the generated output of the generator 6 in the condition that the order rings 1 and 7 are carrying out uniform rotation.

[0023] Moreover, the curve C of drawing 2 (b) shows change of the traction generated on the rear-drive shaft 10 (therefore, rear wheel 7) according to the input-shaft rotation difference (that is, rotator rotation difference of a generator 6 and an induction motor 8) of the order ring transmission 4 and 9. The operation which the traction generated in a rear wheel 7 becomes large, the load to a front wheel 1 becomes large so much, and the case where a big slip is generated for a front wheel 1 by this reduces the traction, makes a slip finish with, and makes it re-stick will work greatly.

[0024] As mentioned above with the four-wheel-drive equipment of the gestalt of this operation Are in a compound electric vehicle and the power of the generator 6 driven by the prime mover 3 for driving a front wheel 1 is stored electricity at a capacitor or a battery. Since the power of a generator 6 is directly supplied to an induction motor 8 and it is made to carry out the rotation drive of the rear wheel 7 compared with the conventional four-wheel-drive equipment which drives a rear wheel 7 by carrying out the rotation drive of the motor for rear drives using the accumulation-of-electricity force The expensive and complicated circuit supply for power conversion is not needed, but it is made the simplified configuration, and can constitute in cost and cheaply.

[0025] Moreover, to transit, it is a two-flower drive, and if it will be in a run state for which a four-wheel drive is truly needed, it becomes a four-wheel drive automatically and fuel consumption can usually be improved.

[0026] Moreover, since the rotation drive of the induction motor 8 for rear drives is carried out by generated output with the generator 6 by the side of the front wheel 1 which is the 1st wheel driving shaft fundamentally, there is no condition which a rear wheel 7 rotates more quickly than a front wheel 1, i.e., a possibility that a rear wheel 7 may slip previously.

[0027] Furthermore, it is the device in which a part for the surplus of a front-wheel drive output is turned to rear drives, and it has the function as TCS (Torque Control System) essentially, without the load of a rear wheel 7 increasing, bringing a result to which it reduces the driving force of a front wheel 1, and making special equipment equip so that the slip of a front wheel 1 is large, and stable transit can be realized.

[0028] In addition, since it only connects by strong \*\* Rhine 12 between a front-wheel drive and a

rear-drive device, space-saving-ization can be attained.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The block diagram showing the configuration of the gestalt of one operation of this invention.

[Drawing 2] The graph which shows the front-wheel rotational frequency-generated output property of the generator in the gestalt of the above-mentioned operation, and the graph which shows the rotational-speed difference-rear wheel traction property of an order ring.

[Description of Notations]

- 1 Front Wheel
- 2 Front-Wheel Driving Shaft
- 3 Prime Mover
- 4 Transmission
- 5 Differential Gear
- 6 Generator
- 7 Rear Wheel
- 8 Induction Motor
- 9 Transmission
- 10 Rear-Drive Shaft
- 11 Differential Gear
- 12 Three Phase Strong \*\* Rhine

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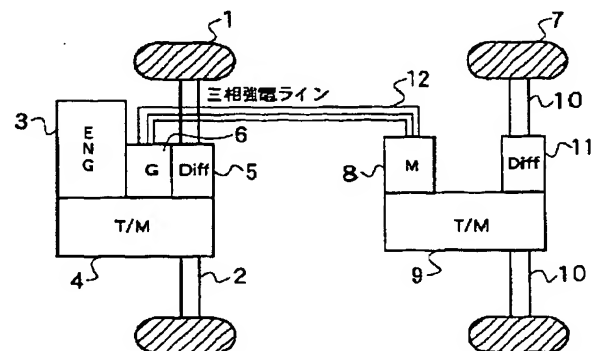
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(54) 【発明の名称】 四輪駆動装置

(57) 【要約】

【課題】 きわめて単純な構成で、パートタイム4WD  
が実現できる複合電気自動車を提供する。

【解決手段】 後輪7の駆動用に誘導電動機8を備え、  
この誘導電動機を前輪1側に設けられている発電機6の  
交流発電電力によって駆動するようにしている。誘導電  
動機8はその特性により、固定子の生成する回転磁界と  
回転子の回転速度とがずれることによってトルクを発生  
して回転子を回転駆動するので、自動車の前輪1がスリ  
ップを起こさずに回転している走行状態では、後輪7も  
前輪1と同じ回転速度で従動回転し、誘導電動機が抵抗  
となることもなく、また回転トルクを発生することもし  
ない。しかし、前輪1がスリップすると、発電機6の発生  
する交流電力により誘導電動機8の固定子に発生する回  
転磁界と回転子の回転速度との間にずれが生じ、後輪7  
に対する駆動トルクが発生し、4WD状態になる。





## 【特許請求の範囲】

【請求項1】 第1の車輪駆動軸及び第2の車輪駆動軸と、  
原動機と、  
前記原動機の回転駆動力によって交流電力を発電する発電機と、  
前記原動機の回転駆動力を前記第1の車輪駆動軸に伝達して回転駆動する第1の伝動装置と、  
前記発電機の交流電力を受電して回転駆動される誘導電動機と、  
前記誘導電動機の回転駆動力を前記第2の車輪駆動軸に伝達して回転駆動する第2の伝動装置とを備えて成る四輪駆動装置。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、電気自動車の四輪駆動装置に関する。

## 【0002】

【従来の技術】従来、たとえば、前後輪のいずれか（以下の説明では、前輪とする）を原動機によって回転駆動する複合電気自動車において、四輪駆動装置を構成する場合、原動機によって前車輪軸を回転駆動すると共に発電機を回転駆動させ、その発電機の交流発電電力をAC-DC変換してキャパシタあるいは蓄電池に蓄電し、その蓄電力を逆にDC-AC変換して後輪駆動用の交流電動機に供給し、この交流電動機によって後車輪軸を回転駆動する構成である。

## 【0003】

【発明が解決しようとする課題】ところが、このような従来の複合電気自動車の四輪駆動装置の場合、原動機による前輪の駆動トルクと交流電動機による後輪の駆動トルクとのトルク配分を運転状況に応じて適切に行う必要があるために、AC-DC変換を行うコンバータ、またDC-AC変換を行うインバータ、そして蓄電するためのキャパシタあるいは蓄電池が必須であり、また、コンバータ及びインバータの適切な制御のために複雑な演算制御を実行するコントローラが必要となり、回路構成が複雑になると共にコスト的に高価になる問題点があった。

【0004】本発明はこのような従来の問題点に鑑みてなされたもので、簡単な構成で、コスト的にも安価に構成でき、しかも、四輪駆動が必要な走行状況では確実に四輪駆動が行える四輪駆動装置を提供することを目的とする。

## 【0005】

【課題を解決するための手段】請求項1の発明の四輪駆動装置は、第1の車輪駆動軸及び第2の車輪駆動軸と、原動機と、前記原動機の回転駆動力によって交流電力を発電する発電機と、前記原動機の回転駆動力を前記第1の車輪駆動軸に伝達して回転駆動する第1の伝動装置

と、前記発電機の交流電力を受電して回転駆動される誘導電動機と、前記誘導電動機の回転駆動力を前記第2の車輪駆動軸に伝達して回転駆動する第2の伝動装置とを備えたものである。

【0006】請求項1の発明の四輪駆動装置では、第2の車輪軸の駆動用に設けられている電動機が誘導電動機であり、この誘導電動機はその特性により、固定子の生成する回転磁界と回転子の回転速度とがずれることによってトルクを発生して回転子を回転駆動するので、自動車10の第1の車輪駆動軸の車輪がスリップを起こさずに回転している走行状態では、第2の車輪駆動軸の車輪も第1の車輪駆動軸の車輪と同じ回転速度で従動回転し、誘導電動機が抵抗となることもなく、また回転トルクを発生することもなく、したがって、二輪駆動状態で走行する。

【0007】しかしながら、本来の四輪駆動が必要となる走行状況、例えば、滑りやすい路面を走行している場合や第1の車輪駆動時の車輪がスタックした場合のように第1の車輪駆動軸の車輪がスリップを起こすと、この第1の車輪駆動軸の車輪は回転速度が第2の車輪駆動軸の車輪の回転速度よりも大きくなり、速度差が発生する。この結果、誘導電動機の固定子の回転磁界が回転子の回転速度よりも速くなって滑りが発生し、誘導電動機に回転トルクが発生し、これによって第2の車輪駆動軸に回転駆動力を与えてその車輪を回転駆動して四輪駆動状態にする。

【0008】この結果、スリップしていない第2の車輪駆動軸の車輪のグリップ力によってすべりやすい路面での自動車の安定走行を可能とし、またスタックからの脱出を可能にする。

## 【0009】

【発明の効果】請求項1の発明によれば、従来のような複雑な回路構成をなくし、高価な回路部品を必要とすることなく、簡単で、したがってコスト的にも安価にして、本来四輪駆動を必要とする走行状況では確実に四輪駆動に自動的に移行することができるパートタイム四輪駆動装置が構成できる。

## 【0010】

【発明の実施の形態】以下、本発明の実施の形態を図に基づいて詳説する。図1は、複合電気自動車における四輪駆動装置の1つの実施の形態を示している。以下、説明を簡明にするために、第1の車輪駆動軸を前輪駆動軸、第2の車輪駆動軸を後輪駆動軸として説明する。ただし、実用的には前後が入れ替えることが問題になることはない。

【0011】この四輪駆動装置には、前輪1の駆動軸2の回転駆動機構として、原動機（ENG）3、この原動機3の回転駆動力を伝達するためのトランスミッション（T/M）4、このトランスミッション4の回転出力を左右の前輪1に伝達するためのディファレンシャルギア

(Diff) 5、そして、原動機3の回転駆動力で直接に回転駆動されて三相交流電力を発電する発電機(G) 6が備えられている。ここで、発電機6は、原動機3により回転駆動されるトランスミッション4の回転出力によって回転駆動される接続にしてもよい。

【0012】この四輪駆動装置にはまた、後輪7の回転駆動機構として、誘導電動機(M) 8、この誘導電動機8の回転駆動力を伝達するためのトランスミッション

(T/M) 9、このトランスミッション9の回転出力を左右の後輪駆動軸10を通じて後輪7に伝達するためのディファレンシャルギア(Diff) 11が備えられている。

【0013】前側の発電機6と後側の誘導電動機8との間は、三相強電ライン12によって接続されている。そして、発電機6と誘導電動機8とは基本的には同一仕様にして、一方を発電機、他方を誘導電動機として使用している。したがって、回転子、固定子の機械的なサイズ、電気的な特性は同一である。そして、発電機6の三相交流発電力を誘導電動機8の固定子に三相強電ライン12を通して供給するようにしている。

【0014】次に、上記構成の四輪駆動装置の動作を説明する。

【0015】＜通常走行＞前後輪にスリップが発生していない状態での通常走行は、次の通りである。原動機3が発生する回転駆動力をトランスミッション4とディファレンシャルギア5を介して前輪駆動軸2に伝達し、前輪1を回転駆動させ、自動車を走行させる。

【0016】この走行状態では、駆動輪となっている前輪1にスリップが発生していないので前後輪1、7は等速度で回転している。そのため、発電機6の回転子も誘導電動機8の回転子も等速度で回転している。この等速度回転の場合、発電機6は図2(a)におけるB曲線の発電電力を三相強電ライン12を通じて誘導電動機8の固定子に供給する。しかしながら、誘導電動機8の回転子がこの固定子に供給される交流電力で発生する回転磁界と等速度であり、回転駆動力を回転磁界から受けることはなく、したがって、図2(b)のB点に示すように、後輪7のトラクションはほぼゼロである。

【0017】つまり、前後輪1、7間に速度差がない走行状態では、前輪1を駆動輪とする二輪駆動方式で走行することになる。そして、発電機6側の駆動軸(ここでは前輪駆動軸2)のみに駆動トルクが発生するので、誘導電動機8側の駆動軸(ここでは後輪駆動軸10)側の車輪(後輪7)がスリップを起こすこともない。

【0018】＜前輪にスリップが発生した場合＞急発進する場合や滑りやすい路面を走行している場合、また前輪1がスタックしたような場合には、前輪1にスリップが発生して急に回転速度が上昇し、後輪7との間に回転速度差が発生する。

【0019】このような速度差が発生すれば、原動機3

による回転駆動力で前輪駆動軸2は高速で回転し、発電機6の回転子の回転速度が上昇する。この結果、発電機6の発電出力は高い周波数の三相交流にして三相強電ライン12を通じて後輪側の誘導電動機8の固定子に供給される。

【0020】一方、誘導電動機8では、後輪7の回転速度は前輪1の回転速度よりも低いために、その回転子の回転速度も前輪側の発電機6の回転子の回転速度よりも同じ比率だけ低いものとなる。この結果、誘導電動機8の固定子が発生する回転磁界に対して回転子の回転速度に遅れが生じ、図2(b)においてC曲線で示すような駆動トルクを回転子が受け、これに結合されている後輪駆動軸10及び後輪7をその駆動トルクによって回転駆動されるようになる。

【0021】つまり、前輪1にスリップが発生して後輪7との間に回転速度差が生じた場合、その速度差に応じた駆動トルクを誘導電動機8が発生し、それによって後輪7が回転駆動され、結果的に、臨時的に四輪駆動の状態になるのである。これにより、前輪1にスタックが発生していればそのスタックから抜け出すことができ、また、滑りやすい路面でも四輪駆動によって安定した走行が可能となり、また、急発進時にもアクセルの踏み込みに応じた発進加速が得られることになる。

【0022】図2(a)は、前輪1側のトランスミッション4の出力軸回転数に対する発電機6の発電電力の範囲を示したものであり、曲線Aは前輪1が大きなスリップを起こした場合で、レギュレータによって調整が加えられた後の発電機6の発電電力を示し、曲線Bは前後輪1、7が等速度回転している状態での発電機6の発電電力を示している。

【0023】また図2(b)の曲線Cは、前後輪トランスミッション4、9の入力軸回転差(つまり、発電機6、誘導電動機8の回転子回転差)により後輪駆動軸10(したがって、後輪7)に発生するトラクションの変化を示している。これにより、前輪1に大きなスリップが発生した場合ほど後輪7に発生するトラクションが大きくなり、それだけ前輪1に対する負荷が大きくなってそのトラクションを低下させ、スリップを終わらせて再粘着させる作用が大きく働くことになる。

【0024】以上のようにこの実施の形態の四輪駆動装置では、複合電気自動車にあって、前輪1を駆動するための原動機3によって駆動される発電機6の電力をキャパシタ又は蓄電池に蓄電し、その蓄電力を利用して後輪駆動用の電動機を回転駆動させることによって後輪7を駆動する従来の四輪駆動装置に比べて、発電機6の電力を直接に誘導電動機8に供給して後輪7を回転駆動するようにしているので、電力変換のための高価で複雑な回路用品を必要とせず、単純化された構成にしてコスト的にも安価に構成できる。

【0025】また、通常走行では二輪駆動であり、本当

に四輪駆動が必要となるような走行状態になると自動的に四輪駆動になり、燃費が改善できる。

【0026】また、基本的には第1の車輪駆動軸である前輪1側の発電機6による発電電力によって後輪駆動用の誘導電動機8を回転駆動するので、後輪7が前輪1よりも速く回転する状態、つまり、後輪7が先にスリップする恐れが全くない。

【0027】さらに、前輪駆動出力の余剰分を後輪駆動用に回す機構であり、前輪1のスリップが大きいほど後輪7の負荷が増加し、それが前輪1の駆動力を低下させる結果となり、特別な装置を装備させることなくTCS

(Torque Control System)としての機能を本来的に備えており、安定走行が実現できる。

【図面の簡単な説明】

【図1】本発明の1つの実施の形態の構成を示すブロッ

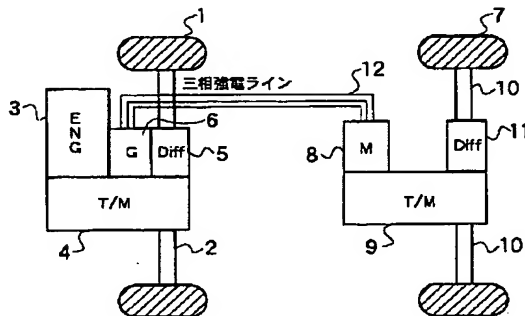
ク図。

【図2】上記の実施の形態における発電機の前輪回転数-発電電力特性を示すグラフ、及び前後輪の回転速度差-後輪トラクション特性を示すグラフ。

【符号の説明】

- 1 前輪
- 2 前輪駆動軸
- 3 原動機
- 4 トランスミッション
- 5 ディファレンシャルギア
- 6 発電機
- 7 後輪
- 8 誘導電動機
- 9 トランスミッション
- 10 後輪駆動軸
- 11 ディファレンシャルギア
- 12 三相強電ライン

【図1】



【図2】

